CLAIMS

We claim:

1. A solar cell assembly for use in an outer space environment or a non-Earth environment, comprising:

a photovoltaic conversion layer configured to produce an electrical current when receiving photons, said photovoltaic conversion layer having a top surface and a bottom surface;

a first electrical contact layer electrically coupled to said top surface and a second electrical contact layer electrically coupled to said bottom surface; and,

a transparent electrically conductive layer disposed proximate said first electrical contact layer configured to receive electrons from an outer space environment and to conduct said electrons away from said photovoltaic conversion layer.

2. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer is constructed from indium tin oxide.

3. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer is constructed from zinc oxide.

4. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer has a thickness of 30-100 nanometers.

5. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer is configured to reflect at least a portion of light wavelengths greater than 5 microns in length.

6. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer is configured to allow at least a portion of light wavelengths less than 5 microns in length to pass therethrough.

7. The solar cell assembly of claim 1, wherein said transparent electrically conductive layer is configured to have an emissivity greater than or equal to 0.8.

8. The solar cell assembly of claim 1, further comprising a second layer of titanium dioxide disposed adjacent said transparent electrically conductive layer.

9. The solar cell assembly of claim 1, further comprising an emissivity layer disposed between said transparent electrically conductive layer and said first electrical contact layer.

10. A method for reducing electro-static discharges in a solar cell assembly used in an outer space environment or a non-Earth environment, the method comprising:

receiving electrons from an outer space environment in a transparent electrically conductive layer covering at least a portion of a solar cell; and,

conducting said electrons through said transparent electrically conductive layer away from said solar cell so that said electrons do not pass through said solar cell.

11. The method of claim 10, wherein said transparent electrically conductive layer is constructed from indium tin oxide.

12. The method of claim 10, wherein said transparent electrically conductive layer is constructed from zinc oxide.

13. The method of claim 10, wherein said transparent electrically conductive layer has a thickness of 30-100 nanometers.

14. The method of claim 10, wherein said transparent electrically conductive layer is configured to reflect at least a portion of light wavelengths greater than 5 microns in length.

15. The method of claim 10, wherein said transparent electrically conductive layer is configured to allow at least a portion of light wavelengths less than 5 microns in length to pass therethrough.

16. The method of claim 10, wherein said transparent electrically conductive layer is configured to have an emissivity greater than or equal to 0.8.